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EXAMINER	
LOGSDON, JOSEPH B	

ART UNIT	PAPER NUMBER
2662	5

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/250,968	HUGHES ET AL.	
	Examiner	Art Unit	
	Joe Logsdon	2662	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 March 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13 and 15-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *15-23* is/are allowed.

6)☒ Claim(s) *1-13 and 24-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Claim Rejections—35 U.S.C. 103(a):

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-13 and 15-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aybay et al. in view of Voelker.

With regard to claim 1, Aybay et al. discloses receiving a request for data transmission through a switch and a corresponding mapping information (column 6, lines 33-37; column 6, lines 59-61). For proper operation every ATM switch includes mapping information indicative of a destination slot to which the data is to be transmitted. Aybay et al. teaches receiving a request for data transmission through a data path multiplexer, which can be a crossbar (column 6, lines 34-37; column 8, lines 12-19), and a corresponding mapping information, the mapping information received by the crossbar and received from one of a plurality of software configurable registers (abstract; Fig. 5; the requests could, for example, be mapped to priority levels; column 6, lines 47-63; because the method of mapping, e.g., FIFO, is programmable, the registers are inherently software programmable). In Aybay et al., the core switch (multiplexer) can be (column 8, lines 12-19) a crossbar, and memory is disclosed to be registers (column 6, lines 52-57). Aybay et al. fails to teach a method for cell replication (abstract). Voelker teaches replicating the data by transmitting the data to the destination slot and to the backup

destination slot when the data arrives at an input slot (column 4, lines 7-10). It would have been obvious to one of ordinary skill in the art to modify the invention of Aybay et al. so that it teaches replication of the data cells because such an arrangement would provide fault tolerance.

With regard to claim 2, Aybay et al.teaches determining whether the destination slots to grant the request are available, the availability being determined by a scheduler, because determining the availability is inherent to a scheduler's function.

With regard to claim 3, Aybay et al. teaches transmitting a control signal to the crossbar once availability is confirmed, the control signal transmitted by the scheduler and indicative of the availability of the destination slots because this feature is inherent to the function of a switch.

With regard to claim 4, Aybay et al. fails to teach sending an acknowledgment back to a source of the request. It would have been obvious to one of ordinary skill in the art to modify the teaching of Aybay et al. so that it teaches sending an acknowledgment back to a source of the request because such an arrangement would enable the source of the request to determine whether the request has been received.

With regard to claim 5, Aybay et al. teaches a data path multiplexer, which could be a crossbar (column 8, lines 12-19), to direct data traffic; and a scheduler (132 in Fig. 5) coupled to the data path multiplexer (column 8, lines 12-19), the scheduler comprising a plurality of signal inputs and a plurality of signal outputs and configured to provide control signals to the crossbar (132 in Fig. 5; Fig. 8, column 8, lines 28 to 58), the plurality of signal inputs being requests for data transmission through the crossbar (column 6, lines 34-37), and the plurality of signal outputs being grants to the requests

(abstract; Fig. 5; column 6, lines 59-61). Aybay et al. teaches that data for which a request for transmission is granted by the scheduler is replicated and processed through the crossbar to a destination slot and to a backup destination slot according to software configurable mapping information (priority of requests is the mapping information; column 4, lines 7-10; column 6, lines 47-63). Aybay et al. teaches a crossbar (the multiplexer can be a crossbar; column 8, lines 12-20) to direct data traffic; and a scheduler coupled to the crossbar (132 in Fig. 5), the scheduler comprising a plurality of signal inputs and a plurality of signal outputs (Fig. 8) and configured to provide control signals to the crossbar (column 8, lines 28-58), the plurality of signal inputs being requests for data transmission through the crossbar, and the plurality of signal outputs being grants to the requests (column 6, lines 33-63). Aybay et al. fails to teach cell replication. Voelker teaches replicating the data by transmitting the data to the destination slot and to the backup destination slot when the data arrives at an input slot (column 4, lines 7-10). It would have been obvious to one of ordinary skill in the art to modify the invention of Aybay et al. so that it teaches replication of the data cells, as in Voelker, because such an arrangement would provide fault tolerance.

With regard to claim 6, the multiplexer in Aybay et al. could be a crossbar (column 8, lines 12-20), and a crossbar inherently has a plurality of data in signals and a plurality of data out signals and is a spatial crossbar.

With regard to claim 7, Aybay et al. teaches a plurality of registers (122-128 in Fig. 5) coupled to the crossbar (130 in Fig. 5) and the scheduler (32 in Fig. 5), the plurality of registers being software configurable and configured to provide the mapping information (priority among the requests) to the crossbar and the scheduler, the mapping

information identifies the data out destination slots of the crossbar to which data is to be transmitted through the crossbar (the mapping information is the priority among the requests ("packet priority scheme"); column 6, lines 33-63).

With regard to claim 8, Aybay et al. teaches that each of the plurality of registers corresponds with one of the plurality of data in signals of the crossbar (column 6, lines 33-63).

With regard to claim 9, Aybay et al. teaches that each of the plurality of registers corresponds with a sequential one of the plurality of data in signals of the crossbar (the priority can be FIFO; column 6, lines 50-52).

With regard to claim 10, Aybay et al. teaches that the scheduler receives mapping information (packet priority scheme") indicative of the destination slots from the registers when a request comes in to one of the plurality of input slots (column 8, lines 28-46).

With regard to claim 11, Aybay et al. teaches that the scheduler determines whether the destination slot and the backup destination slot as identified by the mapping information for the specific input slot are available because determining the availability is inherent to the function of a scheduler.

With regard to claim 12, Aybay et al. teaches that the scheduler transmits a control signal to the crossbar which indicates that data in slot is permitted to send a cell to its intended destination slots once the availability is confirmed because this feature is inherent to the function of a scheduler.

With regard to claim 13, Aybay et al. fails to teach that the scheduler sends an acknowledgment back to a source of the request. It would have been obvious to one of ordinary skill in the art to modify the teaching of Aybay et al. so that the scheduler sends

an acknowledgment back to a source of the request because such an arrangement would allow the source to know whether its request was received.

With regard to claim 24, Aybay et al. teaches an apparatus comprising: means for directing data traffic (multiplexer 130 in Fig. 5); and means for controlling the means for directing (scheduler 132 in Fig. 5), the means for controlling coupled to the means for directing comprising a plurality of signal inputs and a plurality of signal outputs and configured to provide control signals to the means for directing. Aybay et al. teaches that the plurality of signal inputs are requests for data transmission through the means for directing, and the plurality of signal outputs being grants to the requests (column 6, lines 33-37; column 6, lines 59-61). Aybay et al. fails to teach data for which a request for transmission is granted by the means for controlling is replicated and processed through the means for directing to a destination slot and to a backup destination slot according to software configurable mapping information. Voelker teaches replication of the data (column 4, lines 7-10). It would have been obvous to one of ordinary skill in the art to modify the invention of Aybay et al. so that the data are replicated, as in Voelker, because such an arrangement would provide fault tolerance.

With regard to claim 25, Aybay et al. teaches that the means for directing (multiplexer) is further comprised of a plurality of data in signals and a plurality of data out signals and is a spatial crossbar (column 8, lines 12-20; a multplexer inherently has data in and data out signals).

With regard to claim 26, Aybay et al. teaches a plurality of means for storing (112-118 in Fig. 5) coupled to the means for directing (multplexer) and the means for controlling (scheduler), the plurality of means for storing being software configurable and

configured to provide the mapping information to the means for directing and the means for controlling, the mapping information identifies the data out destination slots of the means for directing to which data is to be transmitted through the means for directing (column 6, lines 33-37; column 8, lines 12-20).

With regard to claim 27, Aybay et al. teaches that the plurality of means for storing corresponds (112-118 in Fig. 5) with one of the plurality of data in signals (62-78 in Fig. 5 are data in and data out signals) of the means for directing (column 6, lines 33-46).

With regard to claim 28, Aybay et al. teaches that the plurality of means for storing (112-118 in Fig. 5) corresponds with a sequential one of the plurality of data in signals of the means for directing (62-78 in Fig. 5 are data in and data out signals).

With regard to claim 29, Aybay et al. teaches that the means for controlling (scheduler 132 in Fig. 5) receives mapping information indicative of the destination slot from the means for storing (112-118 in Fig. 5) when a request comes in to one of the plurality of input slots (column 6, lines 33-37; column 6, lines 59-61). Aybay fails to teach that the same treatment is given for a backup destination slot. Voelker teaches replication of data for a backup destination slot. It would have been obvious to one of ordinary skill in the art to modify the teaching of Aybay et al. so that that the means for controlling receives mapping information indicative of the backup destination slot from the means for storing when a request comes in to one of the plurality of input slots because such an arrangement would allow the packets to be sent along destination and backup destination slots as desired.

With regard to claim 30, Aybay et al. teaches that the means for controlling (scheduler) determines whether the destination slot as identified by the mapping information for the specific input slot are available. Aybay et al. fails to teach that the same treamtment is given to backup destination slots. Voelker teaches replication of the data. It would have been obvious to one of ordinary skill in the art to modify the teaching of Aybay et al. so that it teaches that the means for controlling determines whether the destination slot and the backup destination slot as identified by the mapping information for the specific input slot are available, as suggested by Voelker, because such an arrangement would prevent wasting slots.

With regard to claim 31, Aybay et al. teaches that the means for controlling (scheduler) transmits a control signal to the means for directing (multiplexer) which indicates that data in slot is permitted to send a cell to its intended destination slot and backup destination slot once the availability is confirmed because such a feature is inherent to the function of a switch with a scheduler.

With regard to claim 32, Aybay et al. fails to teach that the means for controlling sends an acknowledgment back to a source of the request. It would have been obvious to one of ordinary skill in the art to modify the teaching of Aybay et al. so that the means for controlling sends an acknowledgment back to a source of the request because such an arrangement would be an effective method for error control.

With regard to claim 33, Aybay et al. teaches receiving a request for data transmission through a crossbar and a corresponding mapping information, the mapping information received by the crossbar and received from one of a plurality of software configurable registers (the registers are programmed to order the requests according to

priority; column 6, lines 47-63) , the mapping information indicative of a destination slot to which the data is to be transmitted (the priority scheme determines the destination slot; column 6, lines 47-63). Aybay et al. teaches receiving a request for data transmission through a crossbar and a corresponding mapping information, the mapping information received by the crossbar and received from one of a plurality of software configurable registers (the registers are software configurable to order the requets according to some priority scheme), the mapping information (requests mapped to priorities) indicative of destination slots to which the data is to be transmitted. Aybay et al. further fails to teach that the apparatus is a machine readable medium. The apparatus of Aybay et al. inherently comprises a machine readable medium because, for example, the request buffers are programmed to fill in different manners, so the apparatus must be programmed to fill the request buffers in a specific manner. Aybay et al. fails to teach replicating the data by transmitting the data to the destination slot and to a backup destination slot when the data arrives at an input slot of the crossbar. It would have been obvious to one of ordinary skill in the art to modify the invention of Aybay et al. so that the data are replicated because such an arrangement would provide fault tolerance and error detection.

With regard to claim 34, Aybay et al. teaches that the machine readable medium further causes the determining of whether the destination slot and the backup destination slot to grant the request are available, the availability determined by a scheduler, because such a feature is inherent to a scheduler.

With regard to claim 35, Aybay et al. teaches that the machine readable medium causes transmission of a control signal to the crossbar once availability is confirmed, the

control signal transmitted by the scheduler and indicative of the availability of the destination slot and the backup destination slot because such a feature is inherent to a switch with a scheduler.

With regard to claim 36, Aybay et al. fails to teach that the machine readable medium further causes the sending of an acknowledgment back to a source of the request. It would have been obvious to one of ordinary skill in the art to modify the teaching of Aybay et al. so that the machine readable medium further causes the sending of an acknowledgment back to a source of the request because such an arrangement would be useful for error control.

Reason for Allowance:

3. The prior art fails to teach or fairly suggest a network switch system comprising a plurality of processor cards, line cards, and switch cards; a crossbar; and a scheduler coupled to the crossbar, wherein the scheduler provides control signals to the crossbar, and the signal inputs to the scheduler are requests for data transmission through the crossbar, and the data outputs are grants to the requests, and wherein data for which a request is granted are replicated, as specified in independent claim 15.

Response to Arguments:

4. Applicant argues that there is no mapping information in the cited passages of Aybay et al. But the mapping information for an ATM switch is inherently the VPI/VCI mapping between the input of the switch and the output of the switch.

Applicant further argues that the information is not mapped by the crossbar. But this is inherently the case. An ATM switch comprises a crossbar switch, and the registers are inherently software programmable. .

Applicant argues that the registers of Aybay need not be software programmable. Examiner points out that they can be software programmable. This is what is relevant in the rejection.

Applicant argues that Aybay teaches away from Voelker. But Aybay does not teach away from Voelker, as explained in the rejections in this office action.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the

advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joe Logsdon whose telephone number is (703) 305-2419. The examiner can normally be reached on Monday through Friday from 10:00 am to 6:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou, can be reached on 703-305-4744. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Joe Logsdon

Patent Examiner

Thursday, May 27, 2004

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